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10/671,418	09/26/2003	Kazushige Ohno	82302Y	1355

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EXAMINER

GREENE, JASON M

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 02/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,418

Applicant(s)

OHNO ET AL.

Examiner

Jason M. Greene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-69 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 28-69 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/856,751.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: The reference sign "F", as mentioned in page 11, line 18 of the specification, and the reference sign "R", as mentioned in page 26, line 30 of the specification, are not included in the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The Examiner suggests Applicants update the status of the parent application in the first paragraph of the specification. Application Serial Number 09/856,751 issued as Patent Number 6,669,751 B1 on 30 December 2003.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 28-33, 35, 37, 38, 40, 41, 43-47, 49-53, and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by European Patent Application EP 0 816 065 A1.

With regard to claims 28 and 32, EP 0 816 065 A1 discloses an integral ceramic filter assembly (1) produced by adhering with a ceramic seal layer (4) outer surfaces of a plurality of filters (2,3), each of which is formed from a sintered porous ceramic body, wherein the seal layer has a thickness of 1.5 mm and is formed from 10 weight percent to 70 weight percent of silica-alumina fiber (ceramic fiber), 1 weight percent to 30 weight percent of silica sol, 0.1 weight percent to 5.0 weight percent of carboxymethyl cellulose, and 3 weight percent to 80 weight percent of silicon carbide powder (inorganic grains) in Figs. 1-5 and page 3, line 36 to page 6, line 10.

While EP 0 816 065 A1 does not explicitly disclose the seal layer having a thermal conductance of 0.1 W/mK to 10 W/mK, one of ordinary skill in the art at the time the invention was made would have recognized that the seal layer inherently had a thermal conductance of 0.1 W/mK to 10 W/mK. Since the seal layer disclosed in EP 0 816 065 A1 is identical to the seal layer disclosed and claimed in the instant application, the seal layers will inherently possess the same properties, including thermal conductance.

With regard to claims 29, 33, and 37, EP 0 816 065 A1 discloses the filter being arranged in a casing that is located in an exhaust gas passage of an internal combustion engine to eliminate particulates included in exhaust gas, wherein the average porosity is 43 percent in Figs. 1-5, page 5, lines 48-49, and page 6, lines 6-8.

With regard to claims 30 and 31, EP 0 816 065 teaches the average porosity of the filter being 43 percent in page 5, lines 48-49, and page 6, lines 6-8.

While EP 0 816 065 A1 does not explicitly disclose the filter having a thermal conductance of 20 W/mK to 80 W/mK, one of ordinary skill in the art at the time the invention was made would have recognized that the filter inherently had a thermal conductance of 20 W/mK to 80 W/mK. Since the filter disclosed in EP 0 816 065 A1 is identical to the filter disclosed and claimed in the instant application, the filters will inherently possess the same properties, including thermal conductance.

With regard to claim 35, EP 0 816 065 A1 discloses each filter having a plurality of cells, and each cell having an outer surface which carries at least one oxide catalyst selected from a platinum group element, other metal elements, and oxides of these metal elements in Fig. 1 and page 6, lines 3-5.

With regard to claims 38 and 45, EP 0 816 065 A1 discloses an integral ceramic filter assembly (1) produced by adhering with a ceramic seal layer (4) outer surfaces of a plurality of elongated honeycomb filters (2,3), each of which is formed from a sintered

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porous ceramic body, wherein a ratio L/S between a filter length L in a flow direction of a processed fluid and a filter cross-section S in a direction perpendicular to the flow direction is 0.138 in Figs. 1-5 and page 5, lines 55-57.

EP 0 816 065 A1 discloses the filter length being 150 mm and the cross-section being 1089 mm^2 (33 mm X 33 mm) in page 5, lines 55-57. Therefore the ratio L/S can be calculated to be $150 \text{ mm} / 1089 \text{ mm}^2$ or 0.138 mm/mm^2 .

With regard to claims 40, 44, and 49, EP 0 816 065 A1 discloses the filter being arranged in a casing that is located in an exhaust gas passage of an internal combustion engine to eliminate particulates included in exhaust gas in Figs. 1-5, page 5, lines 48-49, and page 6, lines 6-8.

With regard to claim 41, EP 0 816 065 A1 discloses the filter being formed from a sintered porous silicon carbide body in page 6, lines 14-21.

With regard to claims 43 and 46, EP 0 816 065 A1 discloses each filter having a plurality of cells, and each cell having an outer surface which carries at least one oxide catalyst selected from a platinum group element, other metal elements, and oxides of these metal elements in Fig. 1 and page 6, lines 3-5.

With regard to claim 47, EP 0 816 065 A1 discloses the form of the filter being a triangular pole-like shape or a hexagonal pole-like shape in Fig. 1.

With regard to claims 50 and 57, EP 0 816 065 A1 discloses an exhaust gas purification apparatus including a honeycomb filter formed from a sintered porous ceramic body and arranged in a casing that is located in an exhaust gas passage of an internal combustion engine to eliminate particulates included in exhaust gas, wherein the average pore diameter of the honeycomb filter is 10 μm and the average porosity is 43 percent in Figs. 1-5, page 5, lines 48-49, and page 6, lines 6-8.

While EP 0 816 065 A1 does not explicitly disclose the honeycomb filter having 20 percent or more of through pores or the ratio of through pores being 20 percent to 50 percent, one of ordinary skill in the art at the time the invention was made would have recognized that the honeycomb filter of EP 0 816 065 A1 inherently had the claimed pore structure. Since the honeycomb filter disclosed in EP 0 816 065 A1 and the honeycomb filter disclosed and claimed in the instant application are formed from the same material, produced under the same conditions, have identical average pore diameters and average porosity, and have identical wall thicknesses (0.3 mm), the honeycomb filters will inherently possess the same pore structure.

With regard to claim 51, EP 0 816 065 A1 discloses the honeycomb filter comprising a plurality of cells including a first cell having a first end surface sealed by a sealing body and a second cell adjacent to the first cell, the second cell having a second end surface that is opposite to the first sealing body, the second end surface being

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sealed by a sealing body, wherein the thickness of a cell wall defining the cells is 0.3 mm in Figs. 1-5 and page 6, lines 5-8.

While EP 0 816 065 A1 does not explicitly disclose the cell number per square inch being 120 or more, one of ordinary skill in the art at the time the invention was made would have recognized that the honeycomb filter of EP 0 816 065 A1 inherently had a cell number of 120 or more. Since the honeycomb filter disclosed in EP 0 816 065 A1 and the honeycomb filter disclosed and claimed in the instant application have the same cell wall thickness and cell pitch (1.8 mm), the honeycomb filters will inherently possess the same number of cells per square inch.

Furthermore, since the cell pitch of the honeycomb filter of EP 0 816 065 A1 is disclosed, the number of cells per square inch can be determined. Since the cell pitch is the center-to-center distance between adjacent cells, the number of cells in a linear distance can be determined by dividing the linear distance by the cell pitch. For a length of 1 inch (25.4 mm) and a cell pitch of 1.8 mm, the result is 14.1 cells per linear inch. Squaring the result yields 199 cells per square inch. Therefore, the honeycomb filter of EP 0 816 065 A1 is seen as having a cell number of 199 cells per square inch.

With regard to claim 52, EP 0 816 065 A1 discloses the filter being formed from a sintered porous silicon carbide body in page 6, lines 14-21.

With regard to claim 53, EP 0 816 065 A1 discloses each filter having a plurality of cells, and each cell having an outer surface which carries at least one oxide catalyst

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selected from a platinum group element, other metal elements, and oxides of these metal elements in Fig. 1 and page 6, lines 3-5.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 39, 48, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 816 065 A1.

With regard to claims 39 and 48, EP 0 816 065 A1 discloses the filter length being 150 mm in page 5, lines 55-57.

EP 0 816 065 A1 does not disclose the filter length being 167 to 300 mm.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the length of the filter to increase the available filtration area without increasing the cross-section area.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the length of the honeycomb filter in that such is

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merely a choice of design. See *In re Rose*, 105 USPQ 237 and *In re Reven*, 156 USPQ 679.

With regard to claim 56, EP 0 816 065 A1 does not explicitly disclose the total volume of the honeycomb filter being one-fourth to two times the total displacement of the internal combustion engine.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the size of the honeycomb filter in that such is merely a choice of design. See *In re Rose*, 105 USPQ 237 and *In re Reven*, 156 USPQ 679.

Claims 34, 36, 42, are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 816 065 A1 in view of Stobbe et al.

With regard to claims 34 and 42, EP 0 816 065 A1 does not disclose the filters being offset from one another in a direction perpendicular to a filter axial direction.

Stobbe et al. discloses a similar ceramic filter assembly wherein the filters are offset from one another in a direction perpendicular to a filter axial direction in Figs. 1-3.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the offset arrangement of Stobbe et al. for the aligned arrangement of EP 0 816 065 A1 in that such are alternate arrangements in the art for positioning filters to form a filter assembly, mere substitution of one known filter

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arrangement for another in the art without a showing of unobvious or unexpected results being within the scope of one having ordinary skill in the art.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to shift the relative positions of the filters of EP 0 816 065 A1 in that shifting the locations of parts without otherwise modifying the operation of the device is merely a choice of design. See *In re Japikse*, 86 USPQ 70.

With regard to claim 36, EP 0 816 065 A1 Stobbe et al. does not disclose the filter assembly having generally circular cross-section or a generally oval cross-section.

Stobbe et al. discloses a similar integral ceramic filter assembly wherein the ceramic filter assembly has a generally circular cross-section in Figs. 1-4 and col. 7, line 54 to col. 9, line 37.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the generally circular cross-section of the filter of Stobbe et al. into the filter assembly of EP 0 816 065 A1 to allow the filter assembly of EP 0 816 065 A1 to be accommodated in a housing having a circular cross-section, as suggested by Stobbe et al. in Figs. 1-4.

7. Claims 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 816 065 A1 in view of Suzuki et al.

EP 0 816 065 A1 does not disclose the purity of the sintered porous silicon carbide body.

Suzuki et al. discloses a similar sintered porous silicon carbide body having a purity of 98.7 weight percent (2.3 percent by weight impurities), wherein the impurities are aluminum, iron, and oxygen in col. 5, lines 1-11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the high purity silicon carbide of Suzuki et al. into the filter of EP 0 816 065 A1 to provide a silicon carbide having a high melting point and good mechanical strength, as is well known in the art.

8. Claims 58-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 816 065 A1 in view Brassell.

With regard to claims 58 and 67-69, EP 0 816 065 A1 discloses an exhaust gas purifying apparatus having a honeycomb filter having a plurality of cells defined by a cell wall and purifying fluid including particulates with the cell wall, wherein the cell wall purifies fluid including particulates, wherein the filter is located in an exhaust gas passageway of an internal combustion engine in Figs. 1-5 and page 3, line 36 to page 6, line 10.

EP 0 816 065 A1 does not explicitly disclose the specific surface area of the grains forming the cell wall being $0.1 \text{ m}^2/\text{g}$ or more, 0.1 to $1.0 \text{ m}^2/\text{g}$, or 0.3 to $0.8 \text{ m}^2/\text{g}$.

Brassell discloses a similar ceramic filter wherein the specific surface area of the grains forming the cell wall is $1 \text{ m}^2/\text{g}$ or less in col. 1, lines 45-57.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the specific surface area of the filter of Brassell into the honeycomb filters of EP 0816 065 A1 to provide filters having high porosity, low air flow resistance, and low outgassing, as suggested by Brassell in col. 1, lines 45-57.

With regard to claims 59 and 60, EP 0 816 065 A1 discloses the filter being formed from a sintered porous silicon carbide body in page 6, lines 14-21.

With regard to claim 61, EP 0 816 065 A1 discloses each filter having a plurality of cells, and each cell having an outer surface which carries at least one oxide catalyst selected from a platinum group element, other metal elements, and oxides of these metal elements in Fig. 1 and page 6, lines 3-5.

With regard to claims 62 and 63, EP 0 816 065 teaches the average pore diameter of the filter being 10 μm and the average porosity of the filter being 43 percent in page 5, lines 48-49, and page 6, lines 6-8.

With regard to claims 64 and 65, EP 0 816 065 A1 discloses the thickness of the cell wall being 0.3 mm in Figs. 1-5 and page 6, lines 5-8.

While EP 0 816 065 A1 does not explicitly disclose the cell number per square inch being 120 or more, one of ordinary skill in the art at the time the invention was made would have recognized that the honeycomb filter of EP 0 816 065 A1 inherently

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had a cell number of 120 or more. Since the honeycomb filter disclosed in EP 0 816 065 A1 and the honeycomb filter disclosed and claimed in the instant application have the same cell wall thickness and cell pitch (1.8 mm), the honeycomb filters will inherently possess the same number of cells per square inch.

Furthermore, since the cell pitch of the honeycomb filter of EP 0 816 065 A1 is disclosed, the number of cells per square inch can be determined. Since the cell pitch is the center-to-center distance between adjacent cells, the number of cells in a linear distance can be determined by dividing the linear distance by the cell pitch. For a length of 1 inch (25.4 mm) and a cell pitch of 1.8 mm, the result is 14.1 cells per linear inch. Squaring the result yields 199 cells per square inch. Therefore, the honeycomb filter of EP 0 816 065 A1 is seen as having a cell number of 199 cells per square inch.

With regard to claim 66, EP 0 816 065 A1 does not explicitly disclose the honeycomb filter having 20 percent or more of through pores or the ratio of through pores being 20 percent to 50 percent.

However, one of ordinary skill in the art at the time the invention was made would have recognized that the honeycomb filter of EP 0 816 065 A1 inherently had the claimed pore structure. Since the honeycomb filter disclosed in EP 0 816 065 A1 and the honeycomb filter disclosed and claimed in the instant application are formed from the same material, produced under the same conditions, have identical average pore diameters and average porosity, and have identical wall thicknesses (0.3 mm), the honeycomb filters will inherently possess the same pore structure.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (9:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-0987.

Jason M. Greene
Examiner
Art Unit 1724



jmg
January 23, 2004

DUANE SMITH
PRIMARY EXAMINER


1-25-04